

SEQUENCE LISTING

<110> The Trustees of Columbia University

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<120> PAK4, A NOVEL GENE ENDODING A SERINE/THREONINE KINASE

<130> 575/55311-A-PCT-US

<140> 09/718,032

<141> 2000-11-21

<150> PCT/US99/11341

<151> 1999-05-21

<150> 09/082,737

<151> 1998-05-21

<160> 17

<170> PatentIn version 3.1

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<212> DNA

<213> human

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<210> 2

<211> 591

<212> PRT

<213> human

<400> 2

Met Phe Gly Lys Arg Lys Lys Arg Val Glu Ile Ser Ala Pro Ser Asn
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Phe Glu His Arg Val His Thr Gly Phe Asp Gln His Glu Gln Lys Phe
 20 25 30

Thr Gly Leu Pro Arg Gln Trp Gln Ser Leu Ile Glu Glu Ser Ala Arg
 35 40 45

Arg Pro Lys Pro Leu Val Asp Pro Ala Cys Ile Thr Ser Ile Gln Pro
 50 55 60

Gly Ala Pro Lys Thr Ile Val Arg Gly Ser Lys Gly Ala Lys Asp Gly
 65 70 75 80

Ala Leu Thr Leu Leu Leu Asp Glu Phe Glu Asn Met Ser Val Thr Arg
 85 90 95

Ser Asn Ser Leu Arg Arg Asp Ser Pro Pro Pro Pro Ala Arg Ala Arg
 100 105 110

Gln Glu Asn Gly Met Pro Glu Glu Pro Ala Thr Thr Ala Arg Gly Gly
 115 120 125

Pro Gly Lys Ala Gly Ser Arg Gly Arg Phe Ala Gly His Ser Glu Ala
 130 135 140

Gly Gly Gly Ser Gly Asp Arg Arg Arg Ala Gly Pro Glu Lys Arg Pro

145		150		155		160
Lys Ser Ser Arg	Glu Gly Ser Gly Gly	Pro Gln Glu Ser Ser Arg Asp				
	165	170			175	
Lys Arg Pro Leu Ser Gly Pro Asp Val Gly Thr Pro Gln Pro Ala Gly						
	180	185			190	
Leu Ala Ser Gly Ala Lys Leu Ala Ala Gly Arg Pro Phe Asn Thr Tyr						
	195	200			205	
Pro Arg Ala Asp Thr Asp His Pro Ser Arg Gly Ala Gln Gly Glu Pro						
	210	215			220	
His Asp Val Ala Pro Asn Gly Pro Ser Ala Gly Gly Leu Ala Ile Pro						
	225	230			235	240
Gln Ser Ser Ser Ser Ser Ser Arg Pro Pro Thr Arg Ala Arg Gly Ala						
	245	250			255	
Pro Ser Pro Gly Val Leu Gly Pro His Ala Ser Glu Pro Gln Leu Ala						
	260	265			270	
Pro Pro Ala Cys Thr Pro Ala Ala Pro Ala Val Pro Gly Pro Pro Gly						
	275	280			285	
Pro Arg Ser Pro Gln Arg Glu Pro Gln Arg Val Ser His Glu Gln Phe						
	290	295			300	
Arg Ala Ala Leu Gln Leu Val Val Asp Pro Gly Asp Pro Arg Ser Tyr						
	305	310			315	320
Leu Asp Asn Phe Ile Lys Ile Gly Glu Gly Ser Thr Gly Ile Val Cys						
	325	330			335	
Ile Ala Thr Val Arg Ser Ser Gly Lys Leu Val Ala Val Lys Lys Met						
	340	345			350	
Asp Leu Arg Lys Gln Gln Arg Arg Glu Leu Leu Phe Asn Glu Val Val						
	355	360			365	
Ile Met Arg Asp Tyr Gln His Glu Asn Val Val Glu Met Tyr Asn Ser						
	370	375			380	

Tyr Leu Val Gly Asp Glu Leu Trp Val Val Met Glu Phe Leu Glu Gly
385 390 395 400

Gly Ala Leu Thr Asp Ile Val Thr His Thr Arg Met Asn Glu Glu Gln
405 410 415

Ile Ala Ala Val Cys Leu Ala Val Leu Gln Ala Leu Ser Val Leu His
420 425 430

Ala Gln Gly Val Ile His Arg Asp Ile Lys Ser Asp Ser Ile Leu Leu
435 440 445

Thr His Asp Gly Arg Val Lys Leu Ser Asp Phe Gly Phe Cys Ala Gln
450 455 460

Val Ser Lys Glu Val Pro Arg Arg Lys Ser Leu Val Gly Thr Pro Tyr
465 470 475 480

Trp Met Ala Pro Glu Leu Ile Ser Arg Leu Pro Tyr Gly Pro Glu Val
485 490 495

Asp Ile Trp Ser Leu Gly Ile Met Val Ile Glu Met Val Asp Gly Glu
500 505 510

Pro Pro Tyr Phe Asn Glu Pro Pro Leu Lys Ala Met Lys Met Ile Arg
515 520 525

Asp Asn Leu Pro Pro Arg Leu Lys Asn Leu His Lys Val Ser Pro Ser
530 535 540

Leu Lys Gly Phe Leu Asp Arg Leu Leu Val Arg Asp Pro Ala Gln Arg
545 550 555 560

Ala Thr Ala Ala Glu Leu Leu Lys His Pro Phe Leu Ala Lys Ala Gly
565 570 575

Pro Pro Ala Ser Ile Val Pro Leu Met Arg Gln Asn Arg Thr Arg
580 585 590

<210> 3

<211> 250

<212> PRT

<213> human

<400> 3

Phe Ile Lys Ile Gly Glu Gly Ser Thr Gly Ile Val Cys Ile Ala Thr
1 5 10 15

Val Arg Ser Ser Gly Lys Leu Val Ala Val Lys Lys Met Asp Leu Arg
20 25 30

Lys Gln Gln Arg Arg Glu Leu Leu Phe Asn Glu Val Val Ile Met Arg
35 40 45

Asp Tyr Gln His Glu Asn Val Val Glu Met Tyr Asn Ser Tyr Leu Val
50 55 60

Gly Asp Glu Leu Trp Val Val Met Glu Phe Leu Glu Gly Gly Ala Leu
65 70 75 80

Thr Asp Ile Val Thr His Thr Arg Met Asn Glu Glu Gln Ile Ala Ala
85 90 95

Val Cys Leu Ala Val Leu Gln Ala Leu Ser Val Leu His Ala Gln Gly
100 105 110

Val Ile His Arg Asp Ile Lys Ser Asp Ser Ile Leu Leu Thr His Asp
115 120 125

Gly Arg Val Lys Leu Ser Asp Phe Gly Phe Cys Ala Gln Val Ser Lys
130 135 140

Glu Val Pro Arg Arg Lys Ser Leu Val Gly Thr Pro Tyr Trp Met Ala
145 150 155 160

Pro Glu Leu Ile Ser Arg Leu Pro Tyr Gly Pro Glu Val Asp Ile Trp
165 170 175

Ser Leu Gly Ile Met Val Ile Glu Met Val Asp Gly Glu Pro Pro Tyr
180 185 190

Phe Asn Glu Pro Pro Leu Lys Ala Met Lys Met Ile Arg Lys Asn Leu
 195 200 205

Pro Pro Arg Leu Lys Asn Leu His Lys Val Ser Pro Ser Leu Lys Gly
 210 215 220

Phe Leu Asp Arg Leu Leu Val Arg Asp Pro Ala Gln Arg Ala Thr Ala
 225 230 235 240

Ala Glu Leu Leu Lys His Pro Phe Leu Ala
 245 250

<210> 4

<211> 250

<212> PRT

<213> human

<400> 4

Tyr Glu Lys Ile Gly Gln Gly Ala Ser Gly Thr Val Phe Thr Ala Thr
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Asp Val Ala Leu Gly Gln Glu Val Ala Ile Lys Gln Ile Asn Leu Gln
 20 25 30

Lys Gln Pro Lys Lys Glu Leu Ile Ile Asn Glu Ile Leu Val Met Lys
 35 40 45

Glu Leu Lys Asn Pro Asn Ile Val Asn Phe Leu Asp Ser Tyr Leu Val
 50 55 60

Gly Asp Glu Leu Phe Val Val Met Glu Tyr Leu Ala Gly Arg Ser Leu
 65 70 75 80

Thr Asp Val Val Thr Glu Thr Cys Met Asp Glu Ala Gln Ile Ala Ala
 85 90 95

Val Cys Arg Glu Cys Leu Gln Ala Leu Glu Phe Leu His Ala Asn Gln
 100 105 110

Val Ile His Arg Asp Ile Lys Ser Asp Asn Val Leu Leu Gly Met Glu

115

120

125

Gly Ser Val Lys Leu Thr Asp Phe Gly Phe Cys Ala Gln Ile Thr Pro
 130 135 140

Glu Gln Ser Lys Arg Ser Thr Met Val Gly Thr Pro Tyr Trp Met Ala
 145 150 155 160

Pro Glu Val Val Thr Arg Lys Ala Tyr Gly Pro Lys Val Asp Ile Trp
 165 170 175

Ser Leu Gly Ile Met Ala Ile Glu Met Val Glu Gly Glu Pro Pro Tyr
 180 185 190

Leu Asn Glu Asn Pro Leu Arg Ala Leu Tyr Leu Ile Ala Thr Asn Gly
 195 200 205

Thr Pro Glu Leu Gln Asn Pro Glu Lys Leu Ser Pro Ile Phe Arg Asp
 210 215 220

Phe Leu Asn Arg Cys Leu Glu Met Asp Val Glu Lys Arg Gly Ser Ala
 225 230 235 240

Lys Glu Leu Leu Gln His Pro Phe Leu Lys
 245 250

<210> 5

<211> 250

<212> PRT

<213> yeast

<400> 5

Leu Val Lys Ile Gly Gln Gly Ala Ser Gly Gly Val Tyr Thr Ala Tyr
 1 5 10 15

Glu Ile Gly Thr Asn Val Ser Val Ala Ile Lys Gln Met Asn Leu Glu
 20 25 30

Lys Gln Pro Lys Lys Glu Leu Ile Ile Asn Glu Ile Leu Val Met Lys
 35 40 45

Gly Ser Lys His Pro Asn Ile Val Asn Phe Ile Asp Ser Tyr Val Leu
50 55 60

Lys Gly Asp Leu Trp Val Ile Met Glu Tyr Met Glu Gly Gly Ser Leu
65 70 75 80

Thr Asp Val Val Thr His Cys Ile Leu Thr Glu Gly Gln Ile Gly Ala
85 90 95

Val Cys Arg Glu Thr Leu Ser Gly Leu Glu Phe Leu His Ser Lys Gly
100 105 110

Val Leu His Arg Asp Ile Lys Ser Asp Asn Ile Leu Leu Ser Met Glu
115 120 125

Gly Asp Ile Lys Leu Thr Asp Phe Gly Phe Cys Ala Gln Ile Asn Glu
130 135 140

Leu Asn Leu Lys Arg Thr Thr Met Val Gly Thr Pro Tyr Trp Met Ala
145 150 155 160

Pro Glu Val Val Ser Arg Lys Glu Tyr Gly Pro Lys Val Asp Ile Trp
165 170 175

Ser Leu Gly Ile Met Ile Ile Glu Met Ile Glu Gly Glu Pro Pro Tyr
180 185 190

Leu Asn Glu Thr Pro Leu Arg Ala Leu Tyr Leu Ile Ala Thr Asn Gly
195 200 205

Thr Pro Lys Leu Lys Glu Pro Glu Asn Leu Ser Ser Ser Leu Lys Lys
210 215 220

Phe Leu Asp Trp Cys Leu Cys Val Glu Pro Glu Asp Arg Ala Ser Ala
225 230 235 240

Thr Glu Leu Leu His Asp Glu Tyr Ile Thr
245 250

<210> 6

<211> 21

<212> PRT

<213> human

<400> 6

Glu Ile Ser Ala Pro Ser Asn Phe Glu His Arg Val His Thr Gly Phe
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Asp Gln His Glu Gln
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<210> 7

<211> 21

<212> PRT

<213> human;

<400> 7

Glu Ile Ser Pro Pro Ser Asp Phe Glu His Thr Ile His Val Gly Phe
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Asp Ala Val Thr Gly
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<210> 8

<211> 18

<212> PRT

<213> yeast

<400> 8

Ile Ser Tyr Asn Ala Lys His Ile His His Val Gly Val Asp Ser Lys
1 5 10 15

Thr Gly

<210> 9

<211> 21

<212> PRT

<213> human

<400> 9

Asp Ile Gly Ala Pro Ser Gly Phe Lys His Val Ser His Val Gly Trp
1 5 10 15

Asp Pro Gln Asn Gly
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<210> 10

<211> 21

<212> PRT

<213> yeast

<400> 10

Gly Val Ser Ser Pro Thr Asn Phe Thr His Lys Val His Val Gly Phe
1 5 10 15

Asp Pro Glu Thr Gly
20

<210> 11

<211> 8

<212> PRT

<213> human

<400> 11

Lys Lys Glu Leu Ile Ile Asn Glu
1 5

<210> 12

<211> 8

<212> PRT

<213> human

<400> 12

Val Gly Thr Pro Tyr Trp Met Ala
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<210> 13

<211> 268

<212> DNA

<213> mouse

<400> 13

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gagttcctgg aaggcggcgc cctcacggat attgtcaccc acaccaggat gaacgaggaa 180
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gtcatccaca gcgacataaa aacggaca 268

<210> 14

<211> 89

<212> PRT

<213> mouse

<400> 14

Lys Gln Gln Arg Arg Glu Leu Leu Phe Asn Glu Val Val Ile Met Arg
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Asp Tyr Arg His Glu Asn Val Val Glu Met Tyr Asn Ser Tyr Leu Val
20 25 30

Gly Asp Glu Leu Trp Val Val Met Glu Phe Leu Glu Gly Gly Ala Leu
 35 40 45

Thr Asp Ile Val Thr His Thr Arg Met Asn Glu Glu Gln Ile Ala Ala
 50 55 60

Val Cys Leu Ala Val Leu Gln Ala Leu Ala Val Leu His Ala Gln Gly
 65 70 75 80

Val Ile His Ser Asp Ile Lys Thr Asp
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<210> 15

<211> 489

<212> DNA

<213> mouse

<220>

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<222> (410)..(410)

<223> unkown nucleotide

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 aggatgaacg aggaacagat cgccgcccgt gtgcctggct tgtgcttcan gcgctggctt 420
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<210> 16

<211> 6

<212> PRT

<213> mouse

<400> 16

Gly Glu Gly Ser Thr Gly
1 5

<210> 17

<211> 6

<212> PRT

<213> mouse

<400> 17

Ser Leu Val Gly Thr Pro
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